

TUHOLSKE (H.)

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IN order to discuss with any promise of success the treatment of pyloric obstruction, it would appear urgently indicated to pass in review its possible causes and our means and methods for an early diagnostic recognition. Like other important organs in the body, the stomach is becoming more and more the subject of a direct physical and chemical examination, and it is desirable that an exact recognition of its physical conditions should, as in other organs, be followed by successful direct treatment of a medicinal or surgical character.

The causes of pyloric obstruction are almost always of an intrinsic character; exceptionally only is the condition due to adhesions outside of the stomach, or to growths which from without mechanically press upon the pylorus, and rarely to acute flexions or twists.

The intrinsic causes are: contracting cicatrices of gastric ulcers, the rare submucous proliferation of the connective tissue interfering with its dilata-

¹ Read before the St. Louis Surgical Society.



bility, and finally, the presence of a malignant growth.

As long as the examination of the tongue constituted the only or principal means of study of stomach diseases, a differential diagnosis was reached at so late a stage of the disease that surgical interference was out of court, or fatal.

Sooner or later all forms of pyloric obstruction give rise to dilatation of the stomach, vomiting at variable periods after food-ingestion, fermentation of stomach-contents, constipation, and emaciation.

The fact of the dilatation can be easily recognized by percussion, by the stomach-tube being felt through the parietes, and by filling of the stomach with gas or, preferably, water. Gastrectasia from atony of the gastric musculature, by its own history of chronicity, of gastric catarrh, of excessive eating and drinking, and of its great curability by lavage, is readily excluded, and the diagnosis of dilatation of obstruction arrived at.

Whether the two following tests constitute actual demonstrations of obstruction I am not able positively to assert, but they are surely corroborative and of value. Ewald recommends the giving fifteen grains of salol, which in the stomach remains inert. In the intestine, by the action of the alkaline juices, it splits up into carbolic and salicylic acids. The absence of salicylic acid in the urine would show that the salol had not passed the pylorus, provided the kidneys are acting normally. Another test is as follows: An ounce of oil introduced into the stomach, and recoverable some hours later by the siphon stomach-tube, would mean impassable obstruction of the pylorus.

Cicatricial obstruction brings the history of preceding ulceration, known by its dull, continuous pain and its paroxysmal increase upon taking food, its bleeding, by its occurrence in the comparatively young, in the chlorotic or anemic, and its gradual healing. In gastric ulcer, according to Riegel, the acid constituent of the gastric juice is greatly in excess; and in dilatation due to cicatricial obstruction, free hydrochloric acid will generally be demonstrable. The absence of free hydrochloric acid from the stomach in pyloric obstruction (the meal-tests of Leube and Ewald having been observed), demonstrated by the Günzburg phloroglucin-vanillin test, would be strong evidence of carcinoma ventriculi.

With advanced emaciation a pyloric tumor becomes discernible, and with it, generally, exceeding dilatation of the stomach and enormous displacement will be noticeable. In one case upon which I operated the pylorus was felt three inches below and to the right of the umbilicus; in another, also the subject of operation, the tumor presented in the left, and was readily moved across to the right iliac region.

The modern methods of examination of the stomach, as taught by Leube, Einhorn, Günzburg, Riegel, Oser, and others, bring us nearer to an exact diagnosis of its diseases. In cases of legitimate doubt, an exploratory operation should be urged upon the patient.

Pyloric obstruction from any cause, if not relieved, leads to the death of the patient. No medicinal treatment is curative. A great deal may

be accomplished for the relief of the patient's sufferings, and the prolongation of life. The most promising of all remedies is the emptying by washing of the stomach every second or third day, by means of the soft-rubber siphon stomach-tube; the patient's diet should be rigidly limited to food capable of being absorbed by the stomach, and, with its reduced digestive power, predigested food would appear indicated. The abstaining from stomach-feeding absolutely for a few days at regular recurrent intervals of three or four weeks, and the substitution during that time of rectal alimentation, will distinctly benefit the patient.

Pyloric stricture, however, is a surgical disease, and, as Senn tersely puts it, can be successfully dealt with only by surgical means. In a paper (THE MEDICAL NEWS, May 10, 1890, p. 503) on the subject of "Pylorotomy and Gastro-enterostomy for Pyloric Obstruction," I gave a fairly full account of the fact that the general consensus of opinion of surgeons was against the utility, and of some against the legitimacy of pylorotomy for malignant pyloric stricture.

To re-state the position, I will quote from my former paper:

"In Mr. Greig Smith's classical work on *Abdominal Surgery*, page 392, we read:

"With these results before us, we must admit that if pylorotomy is to be considered anything more than a mere 'surgical exercise,' it is to be contemplated only in a very carefully selected class of cases. If the patient is not in fairly good condition, if the stomach is greatly dilated, if the growth

is large, fixed, and displaced, the operation should not be contemplated. And even when the opposite conditions are present, it is doubtful if it could ever be a surgeon's duty to advise the operation; he ought to undertake it only at the patient's urgent request, and after fully and honestly explaining to him the hazardous risk which he undergoes."

The inadequacy of the statistics on the subject may be readily appreciated by a reading of the section on the "Surgery of the Abdomen," by Mears, in the *Annual of the Universal Medical Sciences*, for 1889, page 25.

Professor Buchanan, with regard to the propriety of performing the operation in carcinoma, quotes the opinions of Butlin, and of Billroth, as given by his assistant, Salzer. The former says:

"The excessive mortality due to the operation; the rapidity of recurrence in what have appeared to be most favorable cases for operation; the return of the symptoms of obstruction in some, if not in many, of the cases, and the fact that there does not appear to be one case which can be claimed as a genuine cure, lead me to doubt whether the operation of resection of the pylorus for cancer is ever a justifiable operation."

Salzer states that "Billroth does not only consider the operation of resection of the stomach a justifiable one, but he continues operating with good results in many cases. Of course, he does not operate in cases of carcinoma, if there are already infiltrations and adhesions to the liver and pancreas. In these cases he prefers Woelfler's operation of gastro-enterostomy."

Statistics seem to show but little improvement

since the foregoing was written, and I will now quote from Senn's admirable and hopeful paper, "On the Surgical Treatment of Pyloric Stenosis," published in October, 1891:

"At the Berlin International Medical Congress (1890), Billroth gave an account of twenty-seven pylorectomies, all of which were performed either by himself or his assistants. Of this number twelve recovered from the operation, and fifteen died. Of thirteen pylorectomies for carcinoma which survived the operation, five died after ten months, and one after five years and three months after the operation, from recurrence. There were yet living three women at the time the report was made, of whom two had been operated upon two and one-half and four and one-fourth months previously. Of six resections of the pylorus for cicatricial stenosis, three recovered."

A careful study of most of the recorded cases makes apparent the fact that, almost always, operative procedures were resorted to in patients in an advanced stage of the disease, and in a condition of utter exhaustion. May we not hope for better results with an early diagnosis and an improved surgical technique? When the growth is still limited to the pylorus, and is perhaps of the annular kind, with no secondary involvements or adhesions to other viscera, and the patient is in fair condition, I believe the removal of the growth to be as legitimate and as surely indicated as that of malignant growths elsewhere. Pylorotomy, the Billroth operation, in the hands of its most able and skilled advocates, requires from two to three hours for its performance, and most patients so operated upon die in shock. An opera-

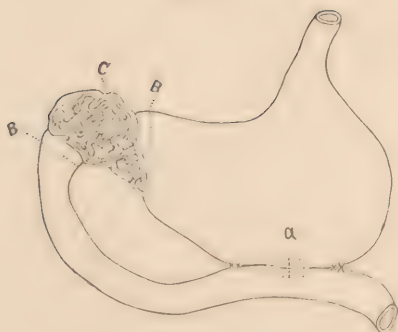
tion requiring less time, and fairly accomplishing the same end—that is, the radical removal of the growth—should have some claims for careful consideration. The operation referred to will be best understood in connection with the following case. (An account of the operation, performed for the first time in March, 1890, was published in *THE MEDICAL NEWS* of May 10, 1890, and was followed by the publication of two cases by Bull, of New York.)

Mrs. B., fifty years of age, married, the mother of six children, German by birth, had suffered for some months with disease of the stomach, when she presented herself for treatment in March, 1891. She had lost considerable flesh, but was not extremely emaciated. She vomited large quantities of food every thirty-six or forty-eight hours, had no appetite, and was constipated. Physical examination revealed great dilatation of the stomach, and the pylorus movable in the left iliac fossa. A woman of exceptional nerve, she readily consented to an operation. I had proposed a gastro-enterostomy after Senn's method, and thought of following it in a few weeks by a pylorotomy. I made an incision over the tumor, which I had pushed to the median line, and found the pylorus free of adhesions. I then drew forward the stomach, found without much difficulty the jejunum, and placed both in easy apposition upon the parietes, with sponges packed underneath and warm aseptic towels around them. I selected a place four inches from the pylorus on the anterior surface of the stomach (that distance, in view of the later pylorotomy) and two inches above the omental attachment, made an incision an inch and a half in length through the

coats of the stomach, introduced my finger into the cavity, examined the pylorus from within, and found it almost impermeable. I then made an incision of the same length into the free margin of the jejunum, and completed the operation by Senn's method, which needs no further description. The patient recovered nicely from the operation; vomiting persisted for three days, and then gradually ceased, and the patient commenced to improve in general health. Two weeks after the operation the patient contracted grieppe-pneumonia, which made her very ill; nor did she recover from its effects for eight weeks. With her gradual improvement she became very urgent for the second operation, and insisted upon having that lump, which she could feel in her belly, removed. Three months after the gastro enterostomy, with the patient in fair condition, I removed the pyloric tumor. A careful examination showed no extension of the disease. I separated the great omentum along the greater, and the gastro hepatic omentum along the lesser curvature of the stomach, by cutting between ligatures introduced with the blunt needle. The ligature was cut at the loop, one thread drawn toward, the other from the stomach, until separated an inch from each other, when each was tied and the intervening omentum cut. A clamp was applied to the duodenum an inch from the growth, and another one to the stomach somewhat further away. The isolated tumor was now cut off with the scissors. I then closed both stomach and duodenum by interrupted sutures passing through all the coats, then invaginated each end, turning the ends in about one-half inch each, and closed by interrupted Lembert silk sutures. The patient made an uneventful recovery.

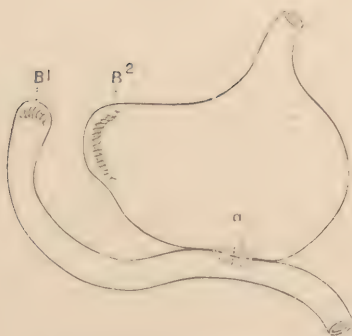
The accompanying cuts fairly illustrate the operation.

FIG. 1.



a. Anastomosis complete.
B, B. Lines of excision.
C. Malignant growth.

FIG. 2.



a. Anastomosis.
B¹. Closed end of duodenum.
B². Closed pyloric end of stomach.

The occurrence of more or less regurgitation of food during the first six days was somewhat disturbing. On the tenth day after the operation the patient sat up in bed and was photographed. She remained in the hospital for five weeks longer, and left because of the excessive heat. I heard nothing of her for some little time, when, in October following, my assistant, Dr. Perkins, was called to see the patient. She was having an attack of vomiting and purging, caused by some improper food; a baby and an older child in her family were similarly affected. They all died within forty-eight hours of the attack. Dr. Perkins with Mr. Deutsch, a senior student, secured a post-mortem examination, and I now possess the specimen of the stomach and bowel. There is nowhere visible a return of the disease, and a careful search in the abdomen revealed no glandular enlargement or other secondary involvement. The specimen, however, teaches a very important lesson. The opening between the stomach and bowel had grown very small, until there remained only a small fistula through which we could pass a lead-pencil.

Each of the operations did not occupy more than thirty-five minutes, and might, with more practice, have been performed in less time.

I believe the operation by making a gastro-enterostomy, allowing the patient to be well nourished and strengthened, and following in about three weeks by pylorotomy—or, in other words, “in two stages”—will give the patient a better chance, and that in malignant growth of the pylorus, limited, recent, and without adhesions, we may secure encouraging results. The contraction of the gastro-enteric communication should be guarded against by much larger incisions, probably from two and a

half to three inches long. The incision in the stomach should not be parallel with the greater curvature, but the anterior wall should be cut diagonally, so that the contracting muscular fibers shall pull in every direction from the opening. It may be that the cutting out of a narrow elliptical piece would meet the indication still better. In malignant growths of the pylorus, in an advanced state, with adhesions and secondary involvements, gastro-enterostomy after the method of Senn will afford the patient some prolongation of life and some comfort. If not postponed until too late, the operation should not be followed by a high rate of mortality.

In Greig Smith's, in Jacobson's, and in Treves's latest works the operation of curetting the pylorus has found a place. As an adjuvant to gastro-enterostomy some little benefit may be derived from it, although the increase of the danger of the operation would hardly warrant that procedure. It is not likely to find any followers.

Pylorotomy should never be performed for non-malignant obstruction, as better and less dangerous methods have been devised, and some of which seem to promise well. Digital dilatation of the pylorus after gastrotomy, according to Loretta, has been resorted to some forty times, with improvement, and some recoveries have been reported. The *cure* of the stricture by forcible dilatation seems to be an exceptional result not secured in any other organ. With a longer period of observation we shall probably learn of a good many relapses; nor is the danger of laceration of the peritoneum and of adhesions to be underrated. The coming operation

for cicatricial pyloric obstruction seems to be the Heineke-Mikulicz pyloroplasty. It promises greater, if not complete and permanent restoration of functional capacity, without being apparently more dangerous than Loretta's digital dilatation. My knowledge of the operation being entirely theoretic, I take great pleasure in quoting Dr. Senn, who has twice performed pyloroplasty and with the best results:

"Pyloroplasty. The safest and functionally most efficient operation for cicatricial stenosis is the one devised by Heineke and Mikulicz nearly at the same time. It is a procedure which well deserves the name it bears, pyloroplasty, as it not only removes the mechanical obstruction, but, at the same time, creates a new pylorus. This operation was first planned and practised by Heineke, of Erlangen, and eleven months later Mikulicz, ignorant of Heineke's work, made the operation in exactly the same manner. The operation is made by cutting the anterior wall of the strictured pylorus and extending the incision about an inch toward the stomach, and the same distance in the direction of the duodenum. The straight incision in the long axis of the pylorus divides the stricture, and the contracted pylorus becomes the posterior wall of the new pylorus by retracting the margins of the wound on each side, at the center, with tenacula, and suturing the wound in an opposite direction to the incision—that is, transversely to the long axis of the stomach. The new pylorus is made up of tissue taken partly from the anterior wall of the stomach and partly from the duodenum, the posterior wall being composed of the narrow contracted pylorus. In suturing the wound it is advisable to tie the

sutures from each angle of the wound, tying the central sutures last. Two rows of sutures, deep and superficial, are employed, the same as in closing a wound of the stomach or intestines. Recurrence of the stricture is a physical impossibility, as the new pylorus is composed mostly of healthy tissue, and the danger attending the operation is not greater than that which accompanies an ordinary intentional wound of the stomach or intestines. The results of this operation, obtained in eight cases which have so far been reported, have been very satisfactory, both in reference to the immediate effects of the operation and the functional results."

In reviewing our resources for the surgical treatment of pyloric obstruction I am forced to the conclusion that, for malignant stenosis, free from adhesions, free from secondary involvements, and of recent date, gastro-enterostomy by the method of Senn, followed by pylorectomy as described and carried out by me, to be the best operation, and it will remain so until a more rapid method of pylorectomy will have been devised. If the method of Maunsell, of New Zealand (*American Journ. Med. Sciences*, March, 1892), be found to sustain the claims of its author, there seems to be some hope in the near future of a further improved technique.

For malignant stenosis, with adhesions and secondary involvements, gastro-enterostomy alone seems to be most available.

For cicatricial or non-malignant stricture of the pylorus, the operation known as the Heineke-Mikulicz pyloroplasty contests successfully, I think, with Loretta's forcible dilatation.

In referring once more to my paper published in 1890, and containing the report of my first case, I find that I have stated the same conclusions, and later developments have not changed the position I then took.

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